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## ATOMISTIC DYNAMISM.

At all cost, we must have truth. It will be  
the achievement of the twentieth century.

*Clémence Royer.*

**I**T is indeed a great delight for progressive and enlightened minds to note the rapid growth of a great family of monistic thinkers, all united by their common recognition of the unity of substance in essence and quality in spite of its marvelous diversity in properties or modalities. It is an obvious fact that in the present day there exists among an even larger quantity of learned people a common sentiment that the fundamental laws and principles of the universe have been grasped at last, or that they will be grasped once for all in the very near future. If it is indeed true that much remains to be known in the immense field of human knowledge, we are fully conscious of what it is that remains to be known, and therefore we are in a far stronger position than those gentlemen who declare that they have received their light from the celestial power. We humbly recognize that there are yet many blanks in our science demanding to be filled, but we become full of hope on seeing that day after day these blanks disappear little by little, and that the hour is at hand when they will be reduced to their smallest expression.

Let us be assured that in reality our present position is strong and grows stronger day after day; that the immense number of facts and laws which the reason of man has already been able to grasp are all connected by a nat-

ural bond of clear logic and evidence. This is precisely the reason why our Japanese and Chinese brothers recognize them, just as our brothers in Great Britain, Spain or Russia. A wonderful thing indeed, that these notions and principles can have been so easily accepted by every lucid brain in the world, without the intercourse of any authority, owing to the mere virtue of their obvious evidence! At the present day there is a vast international movement of thinkers which is growing rapidly both in numbers and clear-sightedness, and is already far stronger than the now worn-out fabrics of the various orthodox churches.

Much has been done in the last century, yet much remains to be done. Indeed every one of us, inside of his own individuality, always feels a natural, imperative, unceasing craving for a full understanding of the cosmos in its inward processes which the cleverest scientists in the world are yet unable to satisfy. As soon as a discovery has been made, enlarging the horizon of human knowledge, we immediately perceive in the distance unexpected vistas toward which our unquenchable thirst for truth impetuously carries us. "The known loses its attractiveness," wrote Claude Bernard, "whereas the unknown is always full of charm." There is no truce and no halt, no rest and no peace. Always we are longing for perfection, always we remain restless and anxious as long as something remains yet undiscovered. It is a natural necessity of our condition as thoughtful and reasoning creatures to puzzle our brains about the irritating question, What remains to be known?

When thought and reflection begin to awake in a man, the cosmos appears to him as a mixture of phenomena whose complex and contradictory character prevents him from perceiving the real mechanism. Upon further consideration we feel quite sure that all these various and multitudinous facts have a common and unique origin. Yet we must frankly recognize that, in spite of the theories built

patiently by so many thinkers, this unique cause remains to be found, this impulsive force of all motions is still a mystery. Wonderfully clever while dealing with small portions of substance, our experimentalists are becoming timid, hesitating and confused, and they even commit big mistakes when they venture to deal with the main laws of the cosmos. Even elementary explanations of some well-known facts or phenomena, such as atoms and molecules, ions and electrons, ether and ponderable matter, mass, force and movement, weight and attraction, fire, light and heat, electricity and magnetism, life and death, thought and sensibility, organic and inorganic bodies, are not in the least correlated in spite of so many endeavors; they are all competing and vying with one another in insoluble contradictions; these wrong explanations reciprocally cancel themselves. We may be sure that even our newest dictionaries cannot furnish us with satisfactory definitions of the above-mentioned words.

However difficult it may appear, the giant problem of the unity of substance must be attacked without delay by the help of the latest accomplishments in natural philosophy. At present, the mind wants to grasp a principle which will be duly recognized by all reasonable minds in the very near future as the primordial and efficient cause of that natural world of ours, as a creative and ruling cause, though atheistic and explainable in a purely natural and scientific way as an ever active and ever obeying cause, an ever living and ever varying cause. Indeed, the mind of man is naturally inclined to consider science, though infinitely ramified in its branches, as starting from a unique trunk or springing from a single germ. A unique force, a monistic law compels the sidereal spheres to follow their gigantic orbs through space, and the small material bodies scattered on their surface to share their destiny. In the same way, we understand that the beautiful green of our

vegetals, the sweet colors of our flowers, the gay concerts of our birds and the infinitely varied cries of the terrestrial mammals, the rays of our sun and pale light of our moon, the blowing of our winds and heat of our fires are some of the various aspects of only one substance, whose own nature, always and everywhere, remains identical with itself. We only wish to possess a fundamental principle connecting and correlating all these physical, chemical and organic branches of knowledge, and illuminating them with indisputable evidence.

We wish it and yet *we have it*. Though many monistic thinkers may be yet unaware of it, that fundamental principle has been duly found out, and the great monistic system which is its logical consequence has been built up once for all. Amidst so many timid scepticisms and backward reasonings, a daring and yet perfectly logical genius has definitely gauged and supervised all the renowned theories, eliminating all the wrong contained in them and wonderfully developing all that proved to be solid and really scientific. Careless about the bitter criticisms made at times by some self-important doctors, a French woman, who was a most intelligent disciple of Newton, Lamarck, and Darwin, spent twenty-five years of her life in elaborating a synthesis of natural philosophy such as the world had never known, a splendid work of truth and harmony which sooner or later will be recognized by all as one of the marvels of the past century and the most remarkable monument of science and knowledge ever created by the human race. With unparalleled acuteness, Clémence Royer has found out the very essence of things: she has intuitively discovered the true nature and mechanism of the etheroids; she has mathematically formulated the laws which rule the life of the cosmical substance and conducted her bold, though perfectly logical, inductions to their ultimate conclusions. Owing to the dynamic and substantialist philosophy built

up by Clémence Royer, all the effects whose causes we were formerly quite unable to detect, may be explained now in a quite satisfactory and scientific way. All or nearly all the riddles of the cosmos may be solved and become clear to our minds.

Owing to a logical induction made by Clémence Royer, we have now the striking proof that the substratum of the cosmos is force, substance and mind at the same time, that it is eternal and indestructible, that it fills the whole space with its expansible monads, everlastingly living and active. Owing to such an hypothesis, we understand that the cosmos is a "continuum" in which unities of substance or force are perpetually fighting. These antagonistic forces are becoming movements on the only spots where there is inequality or lack of equilibrium between them.

Thus force, the cause of movement, is a property of the atom. Force is inherent in the atom and cannot be abstracted from it. But it does not spend itself vainly in mad whirlings, as the energetists advance it, without giving any reasonable proof of such a fanciful idea. It does not spend itself in impossible *chassés-croisés* as the Clausius theory ascribes to the gases. Force is not a property of matter explainable by the old theory of inert atoms or mere geometric points separated by voids and without contact. It cannot be an enigmatic and incomprehensible mutual affinity of the atoms, an inherent power which brings them one towards the other and makes them seek one another. None of these various hypotheses has any scientific value; none can give us any satisfactory explanation of the natural phenomena.

If, on the contrary, we admit that starting from the center of the expansible atom its force radiates towards its periphery, pushing off on all sides the surfaces which the neighbor atoms oppose to it; if we admit that these atomic forces, owing to their inequality, have been the causes of

all the various phenomena which we see through the cosmos, then everything may be logically and scientifically explained, and the greatest part of the problems which remain unsolved in the minds of the scientists will begin to be elucidated.

Struggling perpetually among themselves, the atomic forces are mutually canceled wherever they are equal. The balance of the competing forces is set free where there are differences between them. There these differences are turned into motions. The sum total of the forces of the cosmos which spend themselves in motions, viz., the sum of the "living forces," is certainly very inferior to the sum of the forces which cancel themselves because of their mutual oppositions. Further, if owing to a supposed equality of the ethereal atoms both in force and volume only dead forces were present in the cosmos, its various phenomena could never occur. Being filled with actions and reactions all perfectly equal among themselves, the whole of the cosmos would resemble a kind of Nirvana deprived of any cosmical aggregation as well as any conscious existence. It is to the inequalities in expansible force of the unities of substance that the realities of the cosmos are due.

The atomic unity, the center or focus of force, is no longer this geometric point without volume, this tiny grain of sand, rigid, passive, without virtualities, that the atomists imagined. It is not the fanciful miniature of a solar system which the energetist school seems to take for granted and of which it gives us marvelous descriptions. The unity of substance is not a perpetual miracle whose nature and activities are impossible to understand, a mystery forever impenetrable for our brains, a world of dream and wonder much beyond the scope of the human genius. No, the atom is a reality, a living and active individuality. It already possesses in the lowest degree all the properties, all the virtualities of the organic being. It is owing to the oppo-

sition of the surrounding atomic forces upon its surfaces that an atom may become conscious of its immediate environment. It is the feeling of the atomic forces opposed to its own expansion by the neighboring atoms which causes an atomic unity to react against them. An atom, hypothetically isolated in the midst of a portion of space perfectly void of all matter either ponderable or imponderable, and without any contact with any other atom, would remain deprived of any sensation as well as of any kind of volition or impulsion from its substance. It could never become conscious of its individual existence. The psychical activity of an atom is the result, the logical consequence of its physical activity.

If force is the outward testimony of the atomic activity, a vague dawn of thought and conscience is the inward property of its substance. During the eternity of time, the atom is acquiring a perpetual sensation and consciousness of its environment. All the various sensations constantly felt by its surfaces converge directly towards its center. This science of the infinitely small which it is utterly impossible for us to acquire by direct ways because of the very bulk of our bodies, this science of the universal substratum is obtained by the minute unity of substance. If the tiny unity of substance is wanting in our far-reaching insight, in our variety and intensity of enjoyments, in the breadth, power and superiority of our psychical life, if it is wanting in this relative autonomy which enables us to study all our actions, to direct them in the way we prefer, to master them and control our reflexes when we choose, the humble atom has over the highly organized being the advantage of possessing a concrete and sound knowledge of the inward constitution of substance, which it borrows from the direct, immediate contact of its atomic world, from the convergence towards its center of the various vibrations which are transmitted to its surfaces by its neighbors. Thus the atom

acquires constantly concrete notions of the intrinsic nature of substance without being exposed to those acute feelings or sensations which our highly complex organisms suffer so often. This elementary life or consciousness of the atom may be compared to dreamless sleep in the animal world when the organic functions are at their lowest.

For the elementary unity of substance, the good, or the acme of happiness, consists in a perfect equilibrium of the pressures supported by its surfaces. Theoretically, the atom of ether, in the intrastellar space, assumes the shape of a rhomboidal dodecahedron. The dodecahedron is for the fluid atom the only geometrical form which allows an ideal equilibrium of the pressures supported by its surfaces together with the smallest possible expenditure of repellant energy. Yet the motions of the sidereal spheres through ether, and the heat radiated by these spheres into space unceasingly disturb the theoretical equilibrium of the ethereal monads, and prevent them from assuming the ideal shape of perfect dodecahedrons. Supporting unequal pressures upon each one of its twelve surfaces, the atom of ether is moving spontaneously, automatically, in the direction of the least resistance. As soon as its dynamic equilibrium is restored, it is brought to a standstill. The principles of ballistics which hold good for all kinds of material or ponderable bodies are not applicable to the unities of the intrastellar ether. The elementary living unities have an ethics of their own, an ethics which we human beings, placed for a short time on the top of the tree of life, should be morally obliged to consider. Not only are these ethereal monads the tiny motors perpetually under pressure which move the immense cosmical machine, but they constitute the greatest part of the universal substance and their number is infinitely superior to that of the material unities as well as to that of the organic cell-souls. It is to this vast intercosmic ocean that death gives back the trillions of vaguely

conscious and relatively free elements which constitute organic life.

In a lesser degree than the ethereal monads, ponderable atoms also possess their elementary psychical properties. In the ponderable or material elements, the atomic consciousness is at its lowest. In such a state, the atom appears to find itself in a kind of lethargy, in which suffering and enjoyment are confused in vague, blind sensations which never disappear entirely. Having for an unknown cause lost a portion, great or small, of their substance, the material atoms remain compressed into aggregations, owing to the pressures on their surfaces of the ethereal monads surrounding them. This being granted, we now see that the interatomic and intermolecular cohesion of the ponderable bodies are not the result of a miraculous and hypothetical attraction which the atom might possess. On the contrary, the cohesion of the ponderable bodies is for their elements a state of uneasiness from which they are ready to free themselves as soon as they can. All the phenomena of expansibility of ponderable matter—vaporization, volatilization, sublimation, even radioactivity—may be explained thus in the most natural and scientific way.

In spite of the fact that the cosmos contains a very small quantity of ponderable as compared to that of imponderable substance, the material aggregations constituting the sidereal bodies are formed of so great a number of atoms that the pressure of the ether on their surfaces is very often sufficient to keep their internal mass in a liquid state. Since these pressures of ether are felt on all points of the surfaces of the stars and planets, they assume a more or less spheroidal shape, as may be seen in our solar system. The differences existing in the pressures of the ethereal fluids surrounding the sidereal spheres and unequally heated by them produce the phenomena of weight and gravity. The differences in the pressures of the ether unequally

heated by the solar heat and by that of the major planets constitute the cause of the phenomenon of sidereal gravitation.

With these elementary notions of atomistic dynamism, we already see that in the field of cosmology as well as in those of biology, psychology, ethics and teleology, the theory of the fluid, elastic, indefinitely expansible unity of substance overthrows a very large number of prejudices and wrong ways of thinking still deeply rooted in the minds of many people, of erroneous notions which had been taught to us as a credo, without taking care to explain the how and the why, of many tabu words and sentences which filled our memory but had no meaning at all for our intelligence. In the same way, such a really unique theory of substance throws dazzling lights on all the sciences of organized life as well as on all those of our human race.

ARISTIDES PRATELLE.